Notebook Series -- Notebooks by Experimenters Other Than Edison
General Experiment Books -- Z. P. Halpin Books
Notebook, N-13-07-15

This notebook was used by Zachariah P. Halpin during July-December 1913 for experimental notes on a variety of subjects. Included are tests on disc and cylinder phonographs, similar to those in N-13-06-13 [not selected]. There are also experiments on business and dictating machines and on home and professional kinetoscopes. Additional entries pertain to storage battery testing and to rectifier tests involving Westinghouse, "Chesler," and "stock" machines. Several entries indicate Edison's oversight of Halpin's work in the form of comments, suggestions, instructions, approval, and complaints. The notes indicate that Adolph F. Gall and Charles W. Luhr were doing similar work on the kinetoscope. The front cover is marked "Kineto's." The book contains 5 numbered pages, followed by approximately 100 unnumbered pages.

56700
Acme Co.,
MFG. STATIONERS,
96 JOHN ST.
AND
19 PLATT ST.
NEW YORK.

Cylinder Phono	2903
Disc Phono	2904
Business "	2900
B-2-H Cells	3471
Rectifiers	3165
H.P.K.	2909
Prof. P.K.	2901
Kinetophones	2436
Phono Cylinder Records	2914
Storage Battery Testing	3018
Regulator Test.	2975.

Notes on Phonograph Tests.

New Automatic Stop on A-150 and over.
Ran 140 times - July 15 & 16.
Mr. Edison Passed same July 16, 1913 10 am.
Sent following note to Leeming
New automatic stop been tested - it has not failed once in 2 days.
This stop should be substituted for our old stop on new machines.
See Nicolai.

Mr. Edison told Nicolai - to leave old stop on assembled machines. New machines to have new stop.

Amberola 6 –
To use up present stock of Amberola VI machines Mr. Edison suggested foll. changes.

1 new Governor
2 Pin taken out.
3. Aluminum gear
4 Hardened gov. pinion
5. Wood bearing.
6 - Spring carrier in drive shaft inserted.

Meaning – These are the changes on remainder of Amberola VI.

Go ahead & I will test those you make from time to time as they are assembled.

The changes involved are as follows.

1 – new governor – (a) ivory points pivoted, in heavy cast fork.
(b) Gov disc of tool steel & lacquer, ground and polished on contact side.
(c) Governor balls rounded and lighter
(d) Governor balls weighed in sets so they will run balanced.
(e) Governor springs curved.

2. Carrier pin taken out
3. Aluminum governor shaft driving gear in place of brass.
4. Governor pinion to be hardened
5. Wood intermediate bearing – to hold gears in place.
6 Spring carrier in drive shaft inserted

Draw up Engineering Notice to cover above.

a - 80.
Changes as per model.
Changes will be explained by Luhr.
Tag parts, so they can be reassembled in case of any dispute.
I will send & get samples for test from stock as they come thru factory
Note - Sent by Mr. Edison to Mr. Nicolai.

July 16-1913 - Made test on new stop as follows
~~Stop~~ ~~stop~~ Started and stopped machine 500 times then took speed it was 80 r.p.m.
Ran one hour and took speed again it was still 80 r.p.m.
Ran several records to get regulation found ok. by Mr. Luhr and myself.
Mr. Edison came along and said o.k.

July 18/13.

Poor regulation in one A-60 machine no. 968.
Found cast frame slightly bent causing holes for shaft to be out of alignment. Shaft slightly bent. Reamed out upper hole and put in new shaft.
Regulation now seems good.

July 19, 1913.

Amberola V. After running 110 hours Mr. Edison passed this model.
Speed on four machines tested kept constant throughout test.
Regulation was approved at start by Mr. Edison.
Machines were tested again for regulation at end of test and found O.K.
Mr. Edison kept two reproducers from machines nos. 2697 and 2075.

Only trouble was found in machine 2075 where winding shaft did not line up with hole in cabinet causing handle to bind when winding

Saturday July 19, 1913.

Made following test on E. D. M.
Varying voltage with external resistance and taking speed.

Motor arm Volts	R.P.M.
25.5	100
30	110
32	118
30	114
34	120
36	130
40	138
44	150
50	164
60	185.

Also took these voltage readings
Line 120
Res. drop 84
Motor 36.
Armature 30
Series Field 6..

Reported results to Mr. Edison
he thinks that we ought to use
a variable voltage.
I don't see the difference.

Business machine
12 30 P.M. — machine II with
new governor went bad
in last two days so
Luhr looked it over —
found loose set screw
on the adj. lever stud.

This machine had new armature
put in 7-23-13 by Mr.
Langley who found and
one open circuited.

Sent one machine equipped
with new governor to Mr.
Langley, Elect Dept.

Machine II Restarted July 25/13
at

July 29th 1913

8^30 am. Played 12" record on A-60
Played them up to speed.
Started second time about 3/8 dist.
from inside and again record
played up to speed until 1/4"
from the inside. The above
performance is equal to 1 1/3
12" record - the 1/3 being the
on inside of record.
qpr about ~~10~~ 1 1/2 outside
half on a full ten-inch
record.
Reported to Mr. Luhn that
motor does not start
by itself.

A-150
Starts at 80 on 12" record –

from 1-2 – 79
" ~~3-4~~ 79
" ~~5-6~~ 79
78
2nd 77
76.5
76.5
76 } 15 sec bet readings

fell off in next min.

---

80 77 38
80 77
80 77
80 76 – slows down

in next minute about 1/2" from end of record

---

80 78 1st reading after
80 78 1 min – 15 seconds
80 76 between readings.
80 76

---

80 78
79 77
79 77
79 76

80 Start 77
80 1/2 78
74 end 76.5
76

July 30, 1913.

4 Amberola X machines
Have not got as much
margin as first one
with new governor.

Governors not same as
new one have double springs
and wire not in new
gov. Spring not curved
as per new governor.

Reproduction not quite
as good as in 1st machine

July 30, 1913

Mr. Nicolai sent man up to change governors in Amberola & machines. — 3 00 P.M.

No. II Played 3/8 records up to speed margin not as good as No I

I showed ~~day~~ the safe margin on this machine is 3/8 of a record at speed. Reproduction pretty good.

No. III Trembles badly governor not running exactly Called up Mitchell & sent up man changed governor.

Still trembles — tho not so badly — Fig-it and reproducer connecting tube stick badly 1 1/4 records —

IV — Reproduces well but not as good as No. I and II Plays only 1 1/4 records — ~~no margin to speak~~.

Not much on margin.

~~No~~

V — Trembles a little not as bad as No III — No playing margin on full record.

July 31/13.

Amberola X No II
Good reproduction

Plays one and one half record - tho the second (half) dont seem to be up to speed.

More margin than yesterday.

No. III - Milner took down to investigate trouble - trouble I found several points to complain of worst seems to be a rough spot - bad fit of mandrel on its stationary shaft.

This machine only plays a little about 1/8 to 1/4 over one record - (8-1-13)

~~8-1-13~~

Amberola X No 4. - July 31/13
Plays nearly 1½ - yesterday played only 1¼ records.

8/1/13 Received No-6. equipped with standard jim spring plays 1¼ record to speed -

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Sent 4 and 5 down to Mr. Mitchell to put in new style springs in. at Mr. Nicolai's request reported same to Mr. Luhr and later to Mr. Edison
8-1-13

C21J

8-1-13.

Tested victor machine with 12" record.
Got following results.

1st Round 76-76-76-76

2nd " 76-76-76 38½ min.

3rd " 76-76-76 - 37½ (½ min)

4 " 76-76-37½ (½) - 76

5th " 76-70.

First round 4 min 15 seconds.

Reported to Mr. Edison 4¼ records up to speed.

He said to try another pinion spring machine.

The above victor had double bbl. spring.

2 Gem Machines.
Started 6 P.M. - 8/16/13.
End. of 37 hrs - 8 am. 8/19/13.
Find Reproduction good.
Pinions look o.k.
No. I - no noise
No II slight noise - seems to come from pinion.
Can't stop either machine.
Something wrong about adjustment.

16
30
14
2
12 -13 // 24
24
268

12×24 = 288
72
31 (12) 3 4 (360)

Inspected at 360 hrs. by Mr. Luhr & myself - found pinions o.k. slight abrasion on one, other very good.

~~No. had new spring and~~
Inspected Sept. 4, 1913
by Mr. Luhr & myself.
Running 360 Hrs.
Found slight wear on one
other like new.

Inspected - Sept. 10, 1913
Luhr & Haepin
Found in pretty good con
dition - showing only
slight wear.
Hrs. 470 -.

Wednesday Sept. 3, 1913.

Tested A-60 with new motor
double shafting -
10" record took full speed
readings

1st	80	80	80	80	5 secs between
2nd	80	79.5	79	79	39½
3rd					79

12" Record Long.
I - 80 80 80 80 80 80
II 79 79

12" Record - Same
I 80 - 80 - 80 - 80 - 80 - 80
II 79 - 79 - 38 (½ min).

A - 150 12" Record Same -
I - 80 80 80 80 80 80
II 79 - 78 - 78 -

A - 150 = 1½
A - 60 = 1⅓ to 1½.
Best opt on A-60.

Same.
A-60 - New Governor.

Sept. 4 - 3 P.M. Ladies Gov.

10" Record. -

1 80 - 80 - 80 - 80
2 80 80 80 80
3 80

12"
80 - 80 - 80 - 80 - 80
80 - 79 - 79 - 39 (1/2 min)

Sept. 4th - am.
80 - 80 - 80 - 80
80 79 80 80 - 40

12" Rec.
80 80 80 80 80 80
79 78 79 39 (1/2 min)

Sept 4th - 5 P.M.
Same
A-60 Large Balls (Round)

10" -
1 80 - 80 - 80 - 80 - 20 (1/4 min)
2 80 - 80 - 80 - 79 - 20 "
3 78

12"
1 80 - 80 - 80 - 80 - 80 - 80
2 79 - 79 - 79 - 39 (1/2 min)

Sept. 5th.

A-60 New Motor - Wooden
Regular Gov. with small balls. Cabinet.

Tests Made Sept. 8th, 1913.
Wooden Cabinet.

10" record. - Norine Mauricau
1.- 80 - 80 - 80 - 80
2 - 80 - 80 - 80 - 80
3 - ←——→ 77.

10" record. - Longest { Dreaming Gallicci.
1. - 80 - 80 - 80 - 80 - 40
2 - 79 - 79 - 79 - 79 - 39½

12" record. (R.S. 542-1)
1. - 79 - 79 - 79 - 79 - 80 - 80
2 - 79 - 79 - 77 - 39 (½ min).

12" Record.
1 - 79 - 80 - 80 - 80 - 80
2 - 77 - 77 - 77 - 39 (½ min)

10" Record. (Norine Mauricau)
1 - 80 - 80 - 80 - 80 - 20 (¼ min)
2 - 80 - 79 - 79 - 79 - 39
3 - ←——→ 79

12" Record
1 - 79 - 79 - 79 - 79 - 79 - 79
2 - 79 - 77 - 79 - 19½ (¼ min)

12" Record
1 – 80 - 80 - 80 - 80 - 80 - 80
2 – 79 - 78 - 78 - 18 (1/4 min)

~~Hard Cat.~~ 10" Record.

1. 80 - 80 - 80 - 80 - 40 (1/2 min)
2 80 - 80 - 80 - 80 - 39½ (1/2 min)
3 ←——→ 79

10" Record
1 80 - 80 - 80 - 80 - 40
2 80 - 79 - 79 - 79 -
3 ←——→ 78

~~Hard~~ 10" Record.
1 - 80 - 80 - 80 - 80
2 – 80 - 79½ - 79½ - 79 - 19½ (1/4)
3 – ←——→ 39 (1/2 min)

12" Record
1 – 80 - 80 - 80 - 80 - 80 - 79
2. 79 - 78 - 76 - 74
3

12" Record.
1. 80 - 80 - 80 - 80 - 80 - 80
2 77 - 77 - 77 - 38 (1/2 min)

12" Record.
1 80 - 80 - 80 - 80 - 80 - 80
2 78 - 77 - 77 - 76

10" Record.
1 – 80 - 80 - 80 - 80
2 – 79 - 79 - 79 - 78 - 19½
3 – 78

Comparative Test Made Sept. 9/13.

A-80 Wooden Cat. from Stock.

10" Record.

1 - 80 - 79 - 78 - 78 - 19½ (¼ min)

12" Record.

I - 80 - 79 - 79 - 79 - 79 - 78

A - 150 12" Record.

I - 80 - 80 - 80 - 80 - 80 - 80

II - 79 - 79 - 77

10" Record

I - 80 - 80 - 80 - 80

II 79 - 79 - 79 - 78

III ←——→ 39 (½ min)

A-60 Wooden Cabinet - New Mechanism.

1 - 80 - 80 - 80 - 80 - 80 - 80 } 12" record

✓ 79 - 79 - 79 - 39

1 80 - 80 - 80 - 80 - 20 (¼)

✓ 80 - 80 - 80 - 80 - 20 (¼)

3 ←——→ 80

Above test shows decided improvement over former motor - v. equal to or better than A-150 motor. This A-150 has a special trial spring which is superior to stock on machine

Metal Cabinet | Sept 9/13

machine 680.

Ivory Points, new winding Gear, Special Spring, Special Worm & Barrel - Previously on Test.

10" Record.

1 - 80 - 80 - 78 - 77

2 - 75

10" Record

1 - 79 - 79 - 79 - 77 - 39 (½ min)

2 - 76

10" Record

1 - 78 - 78 - 78 - 77½

2 76 - 37 (½ min)

---

1 - 80 - 80 - 79 - 79

2 - 39 (½ min)

12" Record.

1. 78 - 78 - 77 - 77 - 76 - 75

no second -

Sept. 10 Repeated Tests on A - 80

10" Record.	12" Record.
80 - 80 - 80 - 79	80 - 80 - 79.5 - 79 - 79 - 79
79 - 19½	no margin.

Metal Cabinet # 754
Old Style Governor Lt.
Movement etc.

10" Record. { Prob. not wound full (see below)
80 - 80 - 80 - 80
no second start.

12" -
80 - 81 - 79 - 80 - 80 - 80 slowed
no second start
no margin.

12" Rec. 80 - 81 - 80 - 80 - 80 - 78

A - 150 - Has run 230 hrs.
new kind of spring
.038 - trial spring
Record of 230 hr. run on
sheets in Test Room.
S.M. - 2441.

I - 80 - 80 - 80 - 80 - 20
II 78 - 78 - 77 - 78
III no margin.

On Sept. 12th, 1913 - Made Tests on A-60 new Motor Equipped with Cary spring in place of Nash which broke.
The test resulted as follows:—

10" Record. - Noriane Maureen.
1. 79-79-79-79-19½-15 sec.
2. 79-79-78-79 - 19½ (in 15 sec).

12" Record. - 2nd Test.
1 - 80-80-80-80
2 - 79½-79½-79-79 - 20 (1/4 min)

12" Record.
1 - 80-80-80-80-80-80
2 - 80-79-78

12" Record - same spring after running 200 hrs.
1 - 80-80-80-80-80-80
2 - 78-78-39 (in ½ min)

No I - Gem - ?
No II - Am. Steel & Wire 10'x.021"x5/8"
No III - " " " " 10'x.021"x5/8
No IV - Wallace Barnes Swedish
No V - " " Domestic
No VI - Gem D.

No I - had a tag on it
Tag is lost - Mr. Nicolai said it was a Gem spring so I removed the tag. Mr. Mitchell says now it is a Spencer Spring.

AMBEROLA X MACHINES

		I	II	III	IV	V	VI
7-31-13	200 P.M.	160	160	160	160	160	
	400 "	160	160	160	160	160	
P.M.	600 "	160	160	160	160	160	160
	8 "	160	160	162	160	160	160
	10 "	160	160	162	160	160	160
	12 "	160	162	160	160	160	160
		10					
8-1-13	200	160	160	160	160	160	160
	400	160	160	160	160	160	160
a.m.	600	160	164	160	160	160	160
	800	160	162	160	160	160	160
	1000	160	160	160	160	160	160
	1200	160	160	160	Changed the spring	Changed Spring	160
	200	160	160	160			160
	400	160	160	160			162
P.M.	600	160	160	160	160	160	162
	800	160	160	160	160	160	160
	1000	160	160	160	160	160	160
	1200	160	160	160	160	160	160
		34					
8/4/13	200	160	160	160	160	160	160
	400	160	160	160	160	160	160
	600	160	160	160	160	160	160
a.m.	800	160	160	160	160	160	160
	1000	160	160	Sent to Nicolai	160	160	160
	1200	160	160		160	160	160

Machine I - Main Spring broke 8 30 a.m. 8-4-13 - played 2150 records -.

Machine III Returned to test 4 30 P.M. 8-4-13 - after getting slipping test.
Inspection showed that the spring limiting bridge had been skewed so that main driving gear struck - speed adjustment was away off. - after speed adj. & bridge was fixed machine ran O.K. - same as before.

Machine II - At 5 P.M. 8/4/13 machine showed signs of trouble would not play record thru. Examined but found nothing serious - looked like spring was stuck. Let it stand all night and tried again in morning played O.K. then oiled machine and it played 1 1/2 records - previous test was only 1 1/4 records

		I	II	III	IV	V	VI
8/2/13	200	160	160	Sent	160	160	160
a.m.	4	160	160	to	160	160	160
	6	160	160	Nicoli.	160	160	160
			5r				
8/2/13	800 AM	160	160		160	160	160
	10 "	Main	160		160	160	160
	12 "	Spring	160		160	160	160
	2	Brake	160	adjusted	160	160	160
	4	Out	160	160	160	160	160
P.M.	6	of	160	160	160	160	See opp. page.
	8	Test	160	160	160	160	
	10		160	160	160	160	
	12		160	160	160	160	
8/5/13	2		160	160	160	160	
	4		160	160	160	160	
a.m.	6		160	160	160	160	
	8		160	160	160	160	adjusted 160
	10		160	160	160	160	60
	12		160	160	160	160	60
	2		160	160	160	160	60
	4		160	160	160	160	60
P.M.	6		160	160	160	160	60
	8						
	10						
	12						

Power's Cameragraph.

Test of Mr. Facc's 2nd Machine.

Started 11 a.m. Aug. 20, 1913.

At start of test it was noticed that upper rollers on film gate did not turn.
This would probably increase wear on film.

8-20-13 – 3 30 P.M.
Machine stopped short. Inspection showed that short cross shaft carrying bevel which drives shutter shaft had become bound in its bearing. Cleaned shaft & bearing and reported trouble to Mr. Luhr. Machine stopped one hour.

8-20-13 – 5 30 P.M. – Mr. Edison listened to machine and remarked that he could not hear it

8-21-13 – 3 30 am to 8:00 am { Shut down for rest.

(45)

8-21-13.

1 P.M. – Tendency to lose loop was noticed – seems to be fault of too little tension on tension rollers.

Joe increased tension on rollers also tension on sprocket ~~setting~~ springs –.

I was of opinion that sprocket slipped out and thus allowed film to slip. However with tension roller arms down this is not possible. The fault then must be in tension rollers.

5-30 P.M. – 8-21-13 – Joe oiled machine – machine to be oiled daily during test.

11 AM. End of 48 hours.

Running time	38½ hrs.
Time out	9½ hrs
Resting	6 hrs.
Adjustment	3½ hrs.

8/22/13 – 5 30 P.M. – Mr. Edison saw machine. – noted performance to date and remarked "Very good."

A-60 - Running time with
Carey Spring
Started 9-11-13

9/11 = 3
9/12 = 24
9/13 = 24
9/14 = 8
9/15 = 6
9/16 = 0
9/17 = 7
9/18 = 24
9/19 = 19
9/20 = 24
9/21 = 7
9/22 = 10
9/23 = 10
9/24 = 7

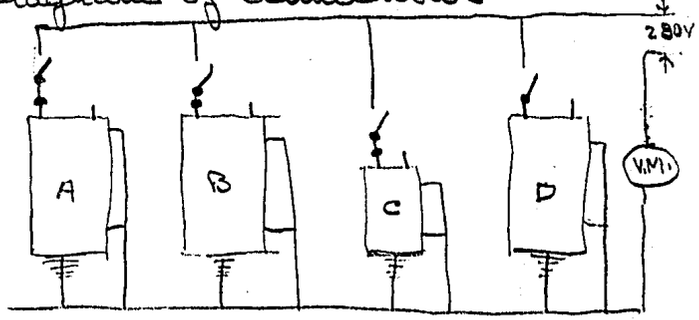
173 total

9/25 2 175 Spring broke
and main worm shaft.

CSCJ

Test of E.S.B. Trays for Current Leakage

① Diagram of Connections



A Rubber covered can and saddles
B H.R. Buttons
C Ford Set (H.R. Buttons)
D Regular "A" construction

A + B trays undoped
C + D " doped

				A	B	C	D
— 12-17-13 —							
sprinkled	10:30	tested	11:00	40	62	0	230
"	5:10	"	5:10	230	230	40	230
		"	5:30	230	230	45	230
— 12-18-13 —							
		Tested	8:30	140	3	198	220
"	11:30	"	11:30	230	230	230	230
			1:10	230	230	230	230
		"	5:00	230	219	230	230
— 12-19-13							
		Tested	8:30	182	0	60	220
Sprinkled	8:30	"	8:30	240	220	240	240
		"	10:00	230	230	240	240
— 12-23-13							
Sprinkled	— 10:00	Tested	10	out	240	new 0	240
		"	3:00	—	232	0	240
"	— 3:00	"	3:00	—	240	0	240
12-24-13							
Sprinkled	— 10:00	Tested	11:30	—	235	130	240

July 25 – 5 P.M.			
26 –	"	24 ✓	1
28	"	48 ✓	2
29		72	3
30		96	4
31		120	5
1		144	6
2		168	7
4		192	8
5		216	9
6		240	10
7		264	11
8		288	12
9		312	13
11		336	14
12		360	15
13		384	16
14		408	17
15		432	18
16	5 P.M.	456	19

Rectifiers
Started 10 a.m. – 7-25-13.
Wasting House –
Chesler –

Westinghouse 4 B-2 cells.
8.2 amperes
Chesler 8.5 amps 5 B-2 cells.

1230 – Chesler's not quite as steady in readings –
Chesler's working on single wave – W. on both waves.

500 P.M. J. Chesler rigged up and started a Stock Rect. and another model.

5¹⁵ P.M. Westinghouse steady
Chesler No 1 very unsteady
Stock Ed. unsteady
Chesler No 2 steady

Wasting House pretty hot –
Chesler No 1 – D.C. magnet coil hot.
" " A.C. coils pretty cool

7-25-13 (1st)

Edison - 5-15-P.M. Radiator feels hot. contacts hot. slight sparking on rear contact.
5.25-P.M.
Chesler no 1 - now steady 10 amps.
not as steady as Westinghouse

Chesler no 2 - A.C. Coils hot
D.C. Coils "
Current steady not as good as Westing.

July 26, 1913 10 45 A.M. 2nd Day

Westinghouse steady at 8 amps
occassional small sparking
Hot generally. - Quiet

Chesler No 1 - 10 amps steady
More noise than W - sparking same as W.
D.C. Coil - hot - A.C. Coils O-K.

Edison - Unsteady at 9 amps - to 9.25
noisy - heat not bad - coils
Radiators very hot.

Chesler no 2 - A.C. Coils very hot
D.C. warm slight sparking current steady 8.25 amps.

July 27, 1913 Sunday (Thirdday)
Stopped Rectifiers from 7 A.M. 7/27 to 7 AM 7/28.

Ran 4th 7/28 and 5th 7/29 24 hrs each day
No trouble noted so far except small sparking on all rectifiers.
7-29-13
AC coils on J. Chesler #2 appear to be burning out.

6th 7/30/13 - 2 P.M. - Westinghouse slight sparking - current steady.

Chesler No 1 - Current unsteady varies between 8 and 9.5 amps. Sparking more than others

Edison Stock – Slight sparking current varies a little bet. 9 and 9.5 amps.

Chesler No 2 – Unsteady current – slight sparking A.C. coils (sec.) very hot.

Nearly all coils are running hot.

(7th) 7/31/13
Conditions about same as 7/30/13 – ran 24 hours.

(8) 8/1/13.
8 P.M. J. Chesler adjusted Chesler No 1 which was sparking occassionally – momentarily.
Other machines running about the same.
Westinghouse more steady than others.

(9) 8/2/13 – Rectifiers ran 24 hrs. nothing unusual.

(10) 8/3/13 – Ran to 7 am. 7 hrs.

(11) 8/4/13 – Starting again at 7 am.

J. Chesler – adjusted No 2 Chesler Rectifier at 10 a.m. 8/4/13. Current had fallen to 6 amperes – readjusted carbon contact – current to 8.2 amps.

One terminal on Westinghouse Machine appears to be badly burned but machine still runs O.K. at 8 amps.

Aug 4th, 1913 – Reported to Mr. Edison.

(12th)
Aug 5th – All running ok.
Westh. – 8 amps
Chesler No 1 – 10.5 – to 11 amps.
Standard – 10.5 – 10
Chesler No 2 – 10 to 9.5

(13)
Aug 6th 1 P.M. All running ok
West – 8 amps – steady
Chesler No 1 – 10-10.5 not steady
Standard – 8.5-9 amps.
Chesler No II – 10 amps.

(14)
Aug 7 – Running ok. no change from aug 6.

~~Aug 8 – Same~~.

(15)
Aug. 8 – Westinghouse sparking badly others about same.
Chesler No 1 – noisy – sparks occasionally.
Stock – noisy – ok.

Chesler No – 2 quiet – good.

Aug 8 11 am.
Westinghouse 8 amps steady
Chesler No 1 – nearly 12 steady.
Stock 9 amps. – fairly steady.
Chesler No 2 – 9 – steady

(16)
Aug 9 – Running same as Aug 8 1913

(17)
Aug 10 – 8.30 am
Westinghouse – 8 amps – not sparking terminal contacts look badly used up. quiet –

Chesler No II – 11 amps – 10 to 11 varies
contacts spark occasionally
noisy

Stock – 8 to 8.5 amps –
noisy – current not steady – no sparking – plunger flaps up when cut off sometimes

Chesler No II – 7.5 to 8 amps
not very steady no sparking

336 hrs to 5 P.M. Aug 11/13

Rectifiers - Aug 12, 1913 same
Westinghouse - Terminal look badly, performance O.K., current 8 amps, sparking stopped, heat about same.

Chesler No I -
Vibrator near iron of A.C. magnet looks as the carbon is worn away.
Noise same.
Current steady 10.5 to 11 amps.
Heat same.
No sparking.
Stock - 9 amps - noise same
no sparking - heat same.
Plunger sticks sometimes.
Chesler No II - Quiet amp: (8 to 9)
sparking - heat same.

Aug 13 - conditions same as Aug 12.

Aug 14 - ~~nothing new~~.
372 hrs.
Chesler No II sparking pretty badly - ~~intermit~~ occasional
Steady

Westinghouse - no sparking - amps steady.

Stock Machine - about same.

Chesler No II - Sparking
A.C. coils hot -

Aug 16, 1913 10 A.M.
Westinghouse O.K. - Contacts worn: Current amps steady.
Chesler No. I - Vibrator touches iron beneath carbon contact which evidently has worn down - needs adjustment

Stock machine - Right hand contacts vibrating member appears to be loose - moves laterally causing increased noise.

Chesler No II - Current has fallen low 5 amps - needs adjustment, carbon contact worn - A.C. coils very hot.

Rectifiers - reported Aug 18, 1913.
Chisler No I & Chisler No. II removed from test because they needed adjustment.
Westinghouse and Stock machine kept on Test.

Aug 21, 1913 —
Westinghouse } Running O.K.
Stock } since Aug 18, 1913

456 + 96 = 552 hours up to 5 P.M. 8/21/13.

Aug 27, 1913
5 P.M.
Westinghouse } Running cont. except
Stock } 14 hrs over Sunday
making 672 hrs to date.

Westinghouse steadier more quiet
Stock machine plunger sticks. as previously reported

8/28/13.

Power off for a few seconds. Westinghouse allowed cells to discharge, as shown by meter. No discharge by Edison rectifiers.

Running time up to 5 P.M. 9/6/13 = 864 hrs.

Neither Westinghouse or Edison has been adjusted since start.
Edison plunger sticks when line is cut off. allowing batteries to discharge.

Running time to Sept 10 1913 — 5 P.M. 936 hrs.

C913

	Hrs	Min.	At
126	2	25	joint
127	1	7	joint
128	2	35	"
129	1	20	"
130	3	35	middle
131	2	40	2' fr. jt.
132	1	35	joint

FILM PERFORFANCE ON MR. GALL'S MACHINE.

No.	Hrs	Min.	At.	Remarks.
1	4	30	No record	Film joined off the floor line at start, at Mr. Curtiss' request.
2	1	45	"	
3	1	40	"	
4	—	—	"	
5	—	—	"	
6	1	50	"	
7	2	40	"	
8	3	0	"	
9	2	20	"	
10	8	30	"	
11	10	50	"	
12	3	15	"	
13	3	10	"	
14	6	30	joint	Mr. Edison hears no sound 18" away without hand to ear
15	1	45	"	
16	5	30	"	
17	1	40	middle	
18	1	50	joint	
19	4	45	"	
20	3	0	1" from jt.	
21	2	5	joint	
22	2	5	"	
23	2	30	"	→ Film from now on joined on floor line - & picture kept in frame
24	4	15	"	
25	2	7	"	

C101

No	Hrs	Min.	At.
26	1	7	joint
27	1	33	"
28	1	15	"
29	3	15	"
30	2	10	"
31		45	"
32	1	10	"
33	2	30	"
34	1	55	"
35		53	"
36	2	15	"
37		25	"
38	2	30	6" fr. jt.
39		55	5" "
40	1	0	5" "
41		26	joint
42	2	0	"
43	2	18	"
44	1	40	"
45		40	"
46		23	"
47		18	"
48	1	10	"
49		20	1" fr. jt.
50		32	" "

	Hrs	Min.	At.
51	1	10	8" fr. jt.
52		50	1" " "
53		37	1" " "
54	2	24	joint
55	1	25	"
56	1	35	near jt.
57	1	0	6" fr. "
58	1	15	joint
59	1	10	middle
60	1	5	none.
61	1	10	" "
62		40	" "
63	1	45	joint
64	1	10	"
65	3	5	1" fr. jt.
66			
67	3	0	middle
68		55	near jt.
69		32	" "
70	2	50	1" fr. "
71	2	35	middle
72	1	15	1" fr. jt.
73	2	5	at jt.
74	1	15	joint
75	4	50	"

	Hrs.	Min.	At.
76	1	28	1" fr. joint
77	4	35	near "
78	2	20	1" fr. "
79	2	25	near "
80	2	0	1" fr. "
81	1	50	joint
82		55	1" fr. "
83		40	joint
84	2	10	1" fr. "
85		33	joint
86	2	5	1" fr. "
87	8	45	joint
88	6		"
89	4	25	"
90	2	35	"
91	2	15	"
92	3	0	"
93	5	40	"
94	9	40	"
95	2	0	"
96	1	0	"
97	5	15	"
98	4	40	"
99	4	0	"
100	2	35	"

	Hrs	Min	At.
100	2	0	joint
102	6	40	"
103	1	45	"
104	9	20	"
105	5	30	"
106	4	0	"
107	2	40	"
108	4	5	"
109	2	30	"
110		25	"
111	2	30	"
112	2	15	"
113		55	joint
114	8	00	"
115		10	joint N.G.
116	3	40	joint
117		17	joint N.G
118	3	0	joint
119	4	50	"
120	4	0	joint
121	1	10	"
122	1	0	"
123	1	5	"
124		25	"
125	2	15	"

NOTES ON TEST OF MR GALLS MACHINE

Test of Mr. Gall's - new Machine
Test started 8 30 a.m. 7-15-13.
Film made up in 10 foot loops.
Speed 60 r.p.m. at crank.
" Equivalent to 960 pict. per min.
Film speed 1 ft. per second.
Film loop passes through machine
6 times per min.
360 " " hour.

Notes.

7-15-13 8.30 a.m. Test started.

7-16-13 8.30 a.m. 9 films broken during 1st. 24 hours.
10 P.M. machine oiled

7-17-13 8 30 a.m. 4 films broken during 2nd 24 hours.

9 30 a.m. - Speed feel - found roller clutch on belt drive slipping. a soft piece in clutch worn allowed rollers to turn. Put in new larger rollers. Mr. Galls says this part is to be hard in new design.

7-17-13 10 30 a.m. Same clutch binding. Adjusted again

11 30 a.m. "Edison hears no sound 18" away without hand to ear."

4 40 P.M. noticed ringing sound - stopped machine - found intermittent sprocket loose eccentric bushing in Genera loose. adjusted.

4 45 P.M. machine oiled

5 00 P.M. gauged film no. 16 found same narrow in gauge and 64 1/2 to 64 3/4 holes to foot. Gauged other film on hand find same troubles.

6 00 P.M. Presence of oil noticed on nearly all films - seems to come from Genera case. New cover showed overcome this fault.

7-18-13 8.30 a.m.	No. 20 on – 6 broken during 3rd 24 hour period.
4.45 P.M.	Mr. Gall called attention to framing of picture. Important because when picture is properly framed the joint is introduced into film gate at slowest speed and also leaves film gate at lowest speed. To keep picture framed it was necessary to change the joints. Heretofore they were not joined on floor line. From now on they are to be joined on floor line.
7-19-13 8.30 a.m.	No. 30 on – 10 broken during 4th 24 hours.
8.45 a.m.	Upper tension spring on film runners fell out – replaced.

7-19-13	
11.30 a.m.	"Noise now 32 in. away instead of 15 no hand to ear. Edison Test."
11.30 a.m.	Found accumulation of emulsion on film runners, cleaned same off. It should be here noted that runners are cleaned after each film. All the test film is new and the emulsion deposits on runners and makes rough surface.
7-20-13	Shut down from 7 a.m. 7/20/13 to 7 a.m. 7/21/13
7-21-13 8.30 a.m.	No. 46 on – 16 broken during 4th 24 hours.
10 a.m.	"Noise about same as last test about 24" – Edison"

7-22-13 830 AM.	No. 65 on – 20 broken during 5th 24 hours.
1040 AM.	Machine oiled.
5 P.M.	"Edison hears noise 20" away"
215 P.M. to 5 P.M.	Machine stopped to alter top of aperture plate – to prevent breaking of film. The top was curved off to prevent joint striking sharp edge of aperture plate, No. 66 running when change was made.
7-23-13	No 73 on – 8 broken during 6th 24 hours. Looks like improvement in aperture plate.
7-24-13 830 AM.	No. 82 on – 9 broken during 7th – 24 hours.
100 AM	"Edison hears only 15" away"
10.50 AM	Machine stopped to adjust runners – outside runner badly scratched. The idea was to give runners more clearance so that they could move more freely. Mr. E. said they bound.
1140 AM	Started again.
230 P.M.	Machine stopped 2 hrs. 20 minutes to change tension & readjust runners No 86 on when change was made.
7-25-13	88 on – 6 broken during 8th 24 hours.
12 M.	"Mr. Edison hears at 15" away"
	Test now on 195 hours no serious sign of wear in any part of machine. Running more quiet than at start.

7-26-13	
	Machine oiled once during each twenty four hours.
6 45 a.m.	Driving Belt broke -- repaired.
830 a.m.	No. 93 on - 6 broken during 9th day (24 hours)
	Mr. Edison remarked that noise was the same as last test.
7-27-13	Sunday - Stopped from 7 a.m. 7-27-13 to 7 a.m. 7-28-13.
7-28-13 8 a.m.	No 99 on - 6 broken during 10th day (24 hours)
	Mr. Edison remarked noise was same.
7-29-13 8 a.m.	No. 105 on - 6 films broken during 11th day (24 hours).
	Noise same. Machine oiled.
7-30-13	No. 113 on - 8 films broken during 11th 24 hours.
	Noise same - Mr. Edison.
7-31-13 830 a.m.	No 120 on - 7 films broken during 12th day (24 hours).
8-1-13	No. 132 on - 12 films broken during 13th day (24 hours).
	During the last day Mr. Gall had the distance between side limiting guides widened out about .015" Seems that this dimension was not heretofore correct it was - it should have been. -
8-1-13 7 a.m.	Mr. Edison stopped test machine was removed for comparative projection test with Power's 6A and Mutiograph.

Mr. Edison's chief complaint during performance of machine seemed to be in the breakage of film.

Several steps were taken to stop breakage.

1 – Framing of picture & joining film on floor line.

2 – Cleaning off of runners after each film break.

3 – Curbing off top of aperture plate.

4 – Changing clearance of film runners and smoothing off same.

5 – Changing tension on film runner springs.

Power's 6A

No.	Hrs	Min.	
1	2	30	Joint.
2	16	30	joint.
3	3	50	" Friction drive noisy.
4	3	33	"
5		10	" Joint N.G.
6	15	45	"
7	2	5	"
8	3	10	"
9	9	50	"
10		50	"
11	8	10	"
12	3	10	"
13	5	25	"
14	6	15	"
15	2	40	Stopped test before it broke.
	77	413	

The friction drive wore rapidly and machine made great noise, on this account when I called Mr. E. attention to it he stopped test July 31, 1913 - 8 30 a.m.

Motiograph.
Started 7-28-13 - 3:20 P.M.

No. 1 45 min. Holes broken
Did not run over night.
No 2 - 15 min. Holes - lost lower loop
No 3 - 10 " " "
No 4 - 10 min " "
No 6 - 10 "
No 7 10 "
On all above the film broke because machine would not hold lower loop.
It looks as if the intermittent sprocket was winking thus tearing holes and loosing loop or else the loop was lost first.

Model D.

No.	Hrs	Min	Brake
1		25	joint
2		10	"
3		20	"
4		25	"
5		30	"
6		55	"
7		40	"
8		5	"
9	1	47	"
10	1	50	"
11		30	"
12	1	0	"
13		40	"
14	1	15	3" fr. jt.
15	1	50	12" " "
16	1	50	joint
17	2	30	"
18			
19		33	"
20		35	"
21		30	"
22	1	48	"
23		22	"
24		55	"
25	1	0	"

Average 54 min
1348 min.

10x60 = 600
748
25 | 1348 | 54
12
98

(121)

	Hrs	Min.		
26	2	5	joint	
27		35	"	
28	1	5	"	
29	1	15	"	
30	1	0	"	
31		35	"	
32	1	15	"	
33	2	20	"	
34		30	"	
35	1	15	"	
36	2	5	"	
37	2	25	4" from "	
38	1	0	near "	
39	7	55	joint	
40	2	50	"	
41	1	10	"	
42	2	0	"	
43		45	"	
44	4	50	"	average 1 hr 57
45	1	35	near joint	
46	1	42	joint	
47	2	20	"	
48	1	0	"	
49	2	0	"	
50	2	20	"	

532
2400
25 | 2932 | 117
25
43
25
182
532

51	1	15	joint	
52	2	0	near "	
53	1	30	joint	
54	4	30	"	
55	2	20	1" fr. jt.	
56	2	20	holes near jt	
57	1	50	joint	
58	1	10	"	
59	1	5	"	
60	1	35	"	
61	1	17	"	
62		33	"	
63	2	5	"	
64	2	45	"	
65	3	45	"	
66	4	50	"	
67		40	"	
68	1	30	"	
69	5	5	3" from "	
70		50	" " "	
71	1	50	at joint	
72	8	5	"	
73	5	10	"	
74	2	5	"	
75	1	0	"	

126
51
6
3060
605
25 | 3660
25
116

605

average.
2 hrs. 26 min

No	Hr	Min.	Broke at	
76	2	35	at joint	
77		45	"	
78	2	5	"	
79		50	"	
80	1	10	3" from "	
81		15	3" " "	
82	1	5	joint	
83	2	25	"	
84	7	30	lost loop	
85	1	30	"	
86	1	20	"	
87		40	"	
88	1	15	"	
89	4	30	joint	
90	7	20	"	
91	2	45	"	
92	3	5	lost loop	
93	1	25	joint	
94		35	lost loop	
95	3	0	" "	3 hrs. 51 min
96	4	15	" "	171
97	7	50	joint	
98	4	35	joint	610
99	4	20	joint	3660
100	4	15	joint.	25 ~~4270~~ 133

Machine oiled once each twenty four hours.
No serious trouble encountered —
Little trouble with lower sprocket roller allowing the loss of lower loop.

Bumping Test - B-2-H.

Started 12 M - 8-9-13
Bumping 1/4" 100-110 per min.

Inspected at 4 30 P.M 8/9/13
no signs of distress

8/11/13 - 8 am. - 20 hours
running found cells ~~O.K.~~ unfull:
Small Splatter on side of
cell seem to have started
to separate from cell in one
or two places. May have been
this way when started.

8/12/13 - 8 AM. - 44 hrs.
Cells O.K. -

44	44
6000	6600
264000	26400
	26400
100 rpm	290,400 110 rpm.

8/13/13 8 AM -
about 420 000 bumps
Ext. Condition O.K.

Stopped test at 570,000 bumps
because acids leaked on two cells

Mr. Monaghan reports that these were merely exhibition cells, were hand welded and not tested for leaks before test began.
The depression in side of cans went up only half way, on new cells this depression will be full length of can.
This should take out a warping noticed in sides of cans.

New Bumping Tests.
Started Aug 21, 1913.
1 - Kammerhoff Zyke started at 5 P.M. - bumps 110 to 120 per min.

5 - A.-4's spot welded holders on side of can.
Started 6 15 P.M. 8/20/13

1 Special Combination Insulators on B-2-H-Cell - started 6 00 P.M. 8/20/13. - 88 bumps per min.

Aug 22, 1913.
B-2-H. Stopped from 10 AM to 1 PM on account of adjustment

All stopped at 3.30 P.M. on account of music in music Room (to 5 PM)

Stopped at 9.45 P.M. music in music room.
Started 1.00

Aug 23rd, 1913 - 9.30 am.

Test no I 1 - Kammerhoff	Test no II 4 - A - 4 Cells	Test no III. 1 - B - 2 - H -
Start 5 PM. 8-21-13	Started 5.15 P.M. 8-21-13	Started 6 PM 8-21-13 Ran 16 hrs at 80 rpm
Off - 3.30 - 5.00 P.M. 8-22-13 1½ hours	Off 1½ hrs 3.30 - 5.00 PM 8-22-13	Off 10.00 am to 12 PM adjustment 8-22-13
off 9.45 to 1 am 3 hrs 15 min	off 9.45 to 1 am 8-22-13	off 3.30 - 5.00 PM 8-22-13
		off 9.45 PM to 1 am 8-22 & 23-13
Speed at 9.30 am 126	Speed at 9.30 107	Speed at 9.30 118
Total time out to 10 am. 8-23-13 4 3/4 hrs.	Total time out to 10 am 8/23/13 4 3/4 hrs	Time out to 10 am 8/23/13 7 3/4 hrs
Stopped 10.20 AM Started 12 M	Stopped 10.20 AM Started 12 M	Stopped 10.20 AM Started 1.30 PM
Stopped 7 AM 8/24/13	same	same
Started Stopped	8.15 Am 9.45 "	8-25-13 "

55
60
3300
110
33000
33
360000 ~~45~~ 120
~~5 60~~

316000
38900.0
705000

354
330,000
684 00

48
60
2880
120
57600
2880
345600
428400
774000

28800
2880
316800
363 000
680 000

288000
330000
618000

59
60
~~3540~~

3540
110
354000

Drop ½ in. 120	Drop 3/16" 110	Drop 3/8" 100
Small Cell Started	A-4 Cells 2.45 P.M.,	B-2 H. 8/25/13.
To 5PM 8/25/13 59½	To 5PM 8-25-13 59 hours	To 5.PM. 8-25-13 55½ hours
428,400 Bumps	~~384,400~~ 354.000	~~330,000~~ 363,000
774,000 to 5PM 6/27/13	684,000 to 5PM 6-27-13	6[illegible],000 to 5PM 6-27-13
126 p. m.	Hard rubber on one side lug pulling loose. 6/28/13. 120	Slight bulging at narrow sides. 104 per. m. 6/28/13.
8/28/13 11 P.M. Cell taken off 1000000 bumps. Returned to Smith	8/29/13 1 P.M. Cells taken off, 1000000 bumps.	8/29/13 10 P.M. Cell taken off. 1000000 bumps.

No damage to any of cells other than already noted at completion of test.

Drop 3/16"
8/29/13. 2 P.M.
5-13-2-14 cells put on bumping test.
120 bumps per. min.

Second Spring on
A – 60 Shaker
Tested Sept 12, 1913

10" – ① 79 - 79 - 79 - 79 - 19½ ¼ min
② 79 - 79 - 78 - 79 - 19½
no margin

10" – 80 - 80 - 80 - 80 - 20
79.5 - 79.5 - 79 - 79 - 20 ¼ min
no margin

12" Rec – 80 - 80 - 80 - 80 - 80 - 80
80 - 79 - 78.

This is about one minute less than ~~last~~ made on spring no I.

3½

Daily Log —
Thursday — Tested records for Mr. Hutchison.
Rectifiers — A-150 — Amberola VIII

Friday — same as Thursday except record tests — also prepared bumping machine for new tests.
E.D.M — Eng. Notes 2155-56.

Mr. Gall's Machine
Test resumed Thursday Sept. 11, 13.
The poor film performance of this machine was traced to two causes. First the tension roller arms and secondly the fact that the film guides on the film gate were not properly lined up.
The first of these causes has been given previously. It would now seem the latter was the more important, because after correcting the former the performance was still poor. While the correction of the latter shows a decided improvement in film performance.
The machine was stopped on Sept. 5 on account of causes previously given.
Returned to test Sept. 11/13
Roller arms have been changed and film guides on gate have been fixed up.

65 Film 2 hrs 50 min - joint.

66. Film 6 hrs 15 min "

67 film 9 hrs 35 min. "
No 67 torn along out side edge.

68 — 3 hrs. 25 min. 1' from joint

69 — 45 min. Experimenting by Mr. Sade.

70 — 1 hr. 40 min.

71 4 hrs 30 min. middle

72 8 hrs. 50 min torn along edge.

73 Note - The films all have tendency to break along outer edge. These breaks eventually cause film to ~~bee~~ ~~broke~~ loop.

73. 1 hr. 30 min

74. 1 hr. 25 min.

75 2 hrs 30 min

76 — 3 hrs 50 min

77 — 6 hrs 20 min.

78 6 hrs 35 min. 2" fr. joint

Took down to line up the shaft of the framing rollers.

79 — 3 hrs 10 min. Rest loop
Outer edge broke first.

80 — 7 hrs 50 min. at joint

81 — 3 hrs 5 min.

82 — 1 hr. 25 min. middle.

Test of Buckled Film for M.P.H.

Friday - 5 P.M. Sept. 19, 1913.
Mr. Fuhr gave me a piece of film from Jameson - badly buckled - kinks from racks.
To Test - as follows: —
Wind tightly on reel — place in oven for 5 hrs at 100° F to 110° F.
To see if kinks will be removed.

Sept. 22, 1913 — Made above test.
Difficulty in winding on reel — unable to keep edges lined up.
Wound on wooden spool. Placed in oven at 105° to 110° F for 6 hrs 12²⁰ P.M. to 5²⁰ P.M.

Gauged before test shows 1/32" (app) under width between outside of holes.
Length - varies between 64 1/2 to 65 holes per ft.

Gauge after test — about same — kinks removed on few outside convolutions inside apparently not affected.

[159]

Monday Sept. 29, 1913 – I made a two page report to Mr. Edison on Mr. Gall's machine.

In this report I stated that I thought the causes of film breaking had been removed. That a film which ran 16 hrs. 35 min. equivalent to 6000 times ~~plus~~ the holes were in test. That films generally broke at ~~fals~~ joint that most of trouble was due to poor joints while the clear film wore very well. I stated that no sign of wear of machine itself had been noticed after running 400 hours. Running time ~~to~~ date

Mr. Edison expressed evident satisfaction. Asked about motor and said next thing to do is to run with motor on –

Test of Film Joints.
Started Nov. 13, 1913. 915 am.

C166

CYLINDER PHONOGRAPHS
Disc Phonographs
PPP